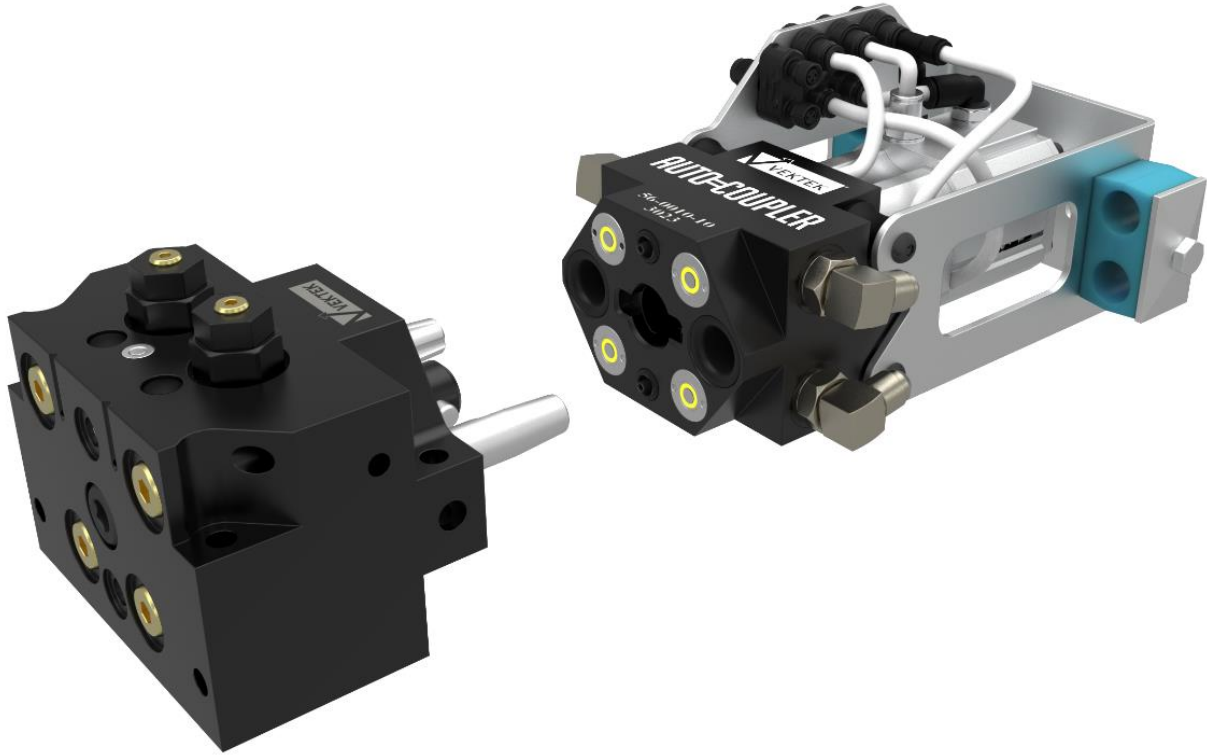


# AUTO-COUPLER



**VEKTEK, LLC**  
Emporia, KS 66801  
1-800-992-0236  
[www.vektek.com](http://www.vektek.com)

**Auto-coupler**

**56-0010-00**

**56-0010-10**

**56-0010-11**

**56-0010-12**



**The Productivity Devices Company**

PL5650 REV. C IAW ECN-5195757

PAGE 1 of 20

Vektek, LLC reserves the right to change specifications without notice as a part of our ongoing product improvement process.

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PL5650 Rev. C IAW ECN-5757

# AUTO-COUPLER Contents:

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## Overview

The AUTO-COUPLER is a solution designed to automate the process of coupling and uncoupling hydraulic circuits on a palletized work holding fixture. The PALLET RECEIVER, like a pallet decoupler, is the part of the system that is located on the fixture or pallet. Once the AUTO-COUPLER is in position on the PALLET RECEIVER using an air slide or a robotic arm, the pneumatic engagement mechanism locks and holds the hydraulic forces from the high-pressure connections without any forces pushing on the fixture. After the AUTO-COUPLER is locked to the PALLET RECEIVER the system is ready to pass hydraulic fluid from the pump to the fixture or.

The AUTO-COUPLER is what transfers the fluid power from the power supply to the PALLET RECEIVER. It uses pneumatic power and valves to couple and lock in place and includes an integrated air blow-off system to clean off the coupling elements before locking. Once locked into place the AUTO-COUPLER utilizes proximity switches to signal that the system is ready to pass hydraulic power through to the fixture. Once pressure has been made on the fixture, the AUTO-COUPLER can be unlocked and retracted so that the pallet can move into place for machining.

The PALLET RECEIVER can accommodate two separate double acting circuits with two independent air passages for pneumatic part sensing. For easy servicing, the PALLET RECEIVER also has accessible cartridge PO check valves and 25-micron filtration. Two pressure relief valves are built in to protect each circuit. It can be manifold mounted on the back side, bottom, or can be hard plumbed using the SAE 6 ports.

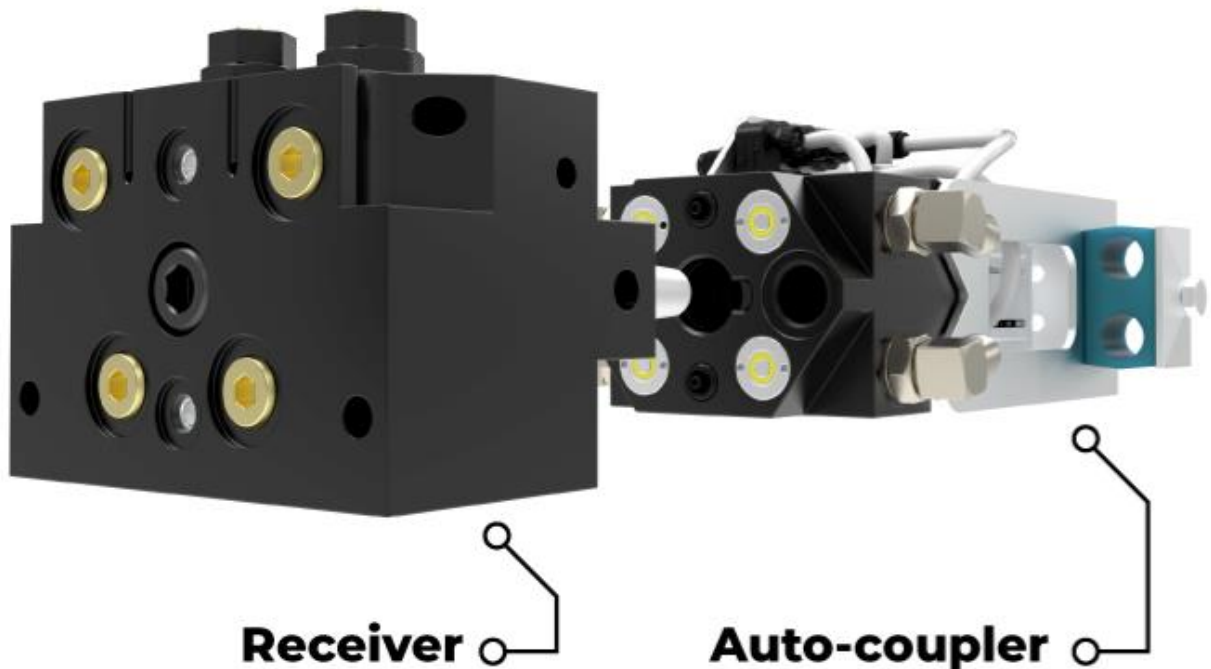


Figure 1: Auto-Coupler and Pallet Receiver Identification

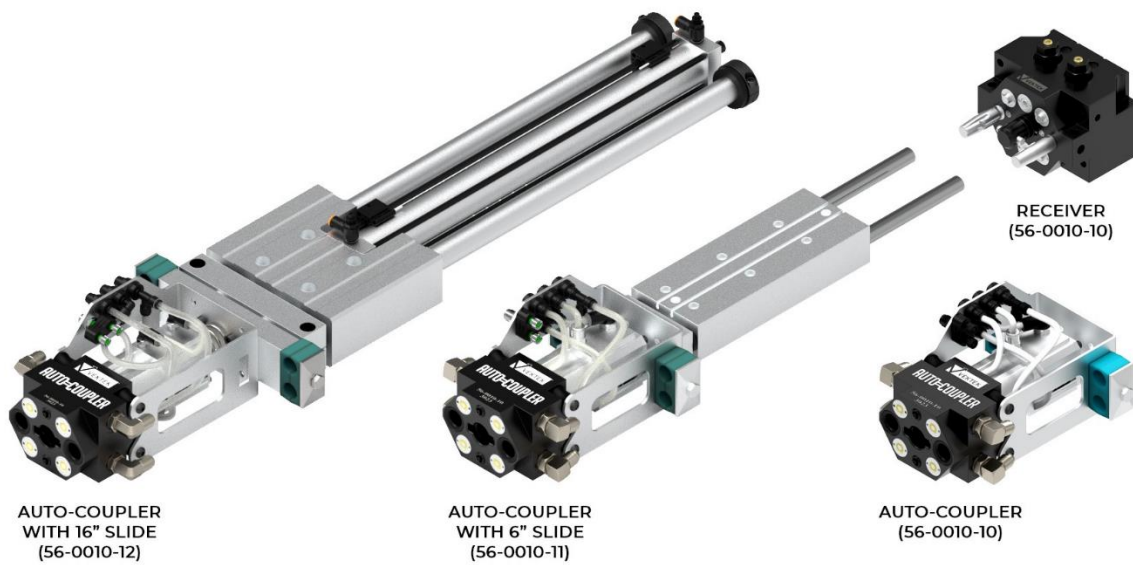


Figure 2: Available Models

**AUTO-COUPLER Pre-installation Checklist** *(what to know before getting started)*

- Location where the PALLET RECEIVER will be mounted on the or fixture?
- How will the AUTO-COUPLER get into position for coupling? (Air slide or robot?)
- If an air slide is being used, what is the length of slide required?
- What will be used to control the AUTO-COUPLER and Pneumatic control valves?
- Will 90-150 PSI air pressure be available?
- Is the hydraulic power supply selected?
- Are P-Block center valves being used?
- How will the hydraulic valves be controlled?

**Pre-installation Mounting Considerations**

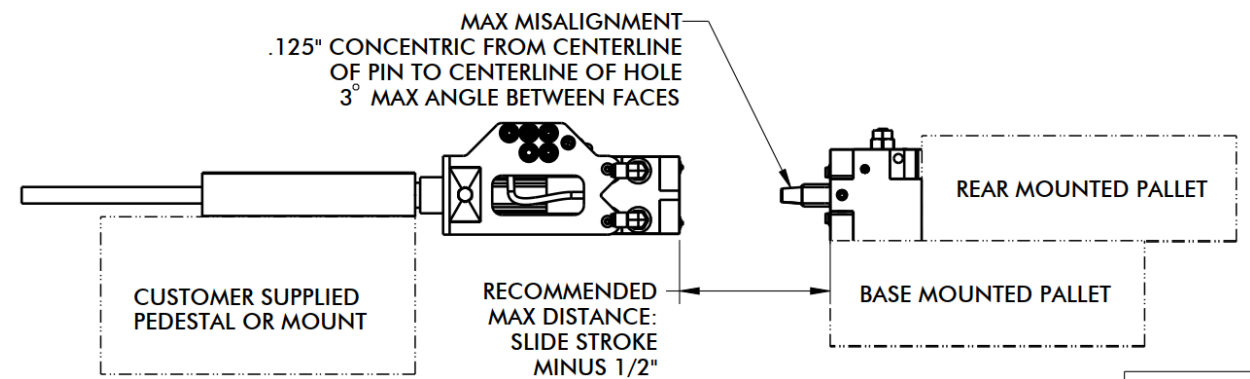
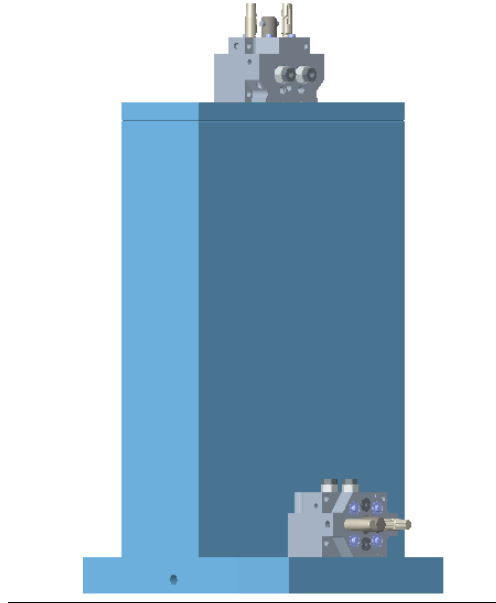


Figure 3: Pre-installation Mounting Considerations

## Installing the PALLET RECEIVER

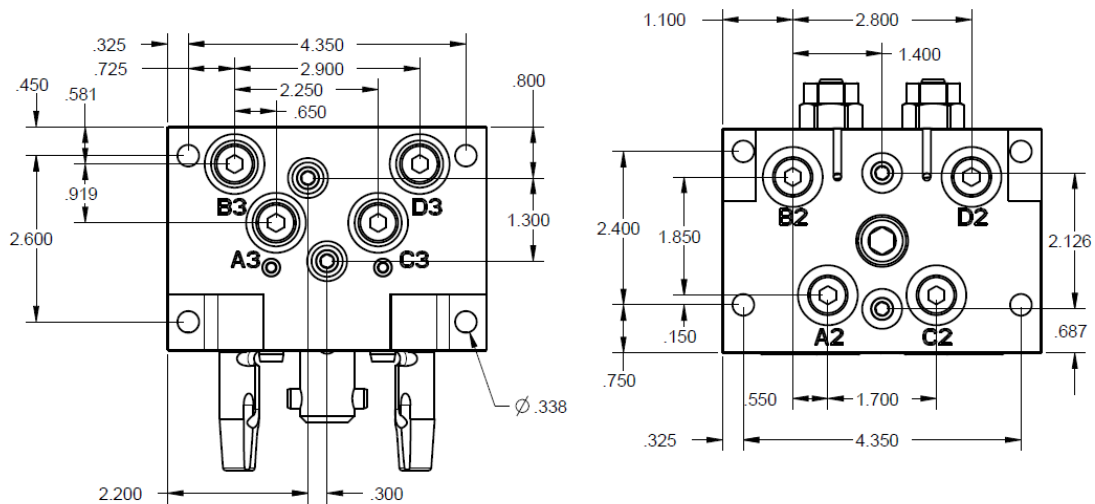
### ***Mounting Considerations***

The PALLET RECEIVER should be mounted in the most accessible location for the AUTO-COUPLER to reach it and couple. The PALLET RECEIVER can be mounted vertically or horizontally depending on what is most convenient.



**Figure 4: Potential Mounting Positions**

**Mounting Pattern:** Mount the PALLET RECEIVER using 4x 5/16" or 4x 8mm bolts oriented so the coupling elements are readily accessible to couple with the AUTO-COUPLER. Mating surface must be flat within 0.003 in with a maximum 63 µin Ra surface finish. For more mounting details instruction sheet IS5650 is available on request.



**Figure 5: PALLET RECEIVER Mounting Dimensions**

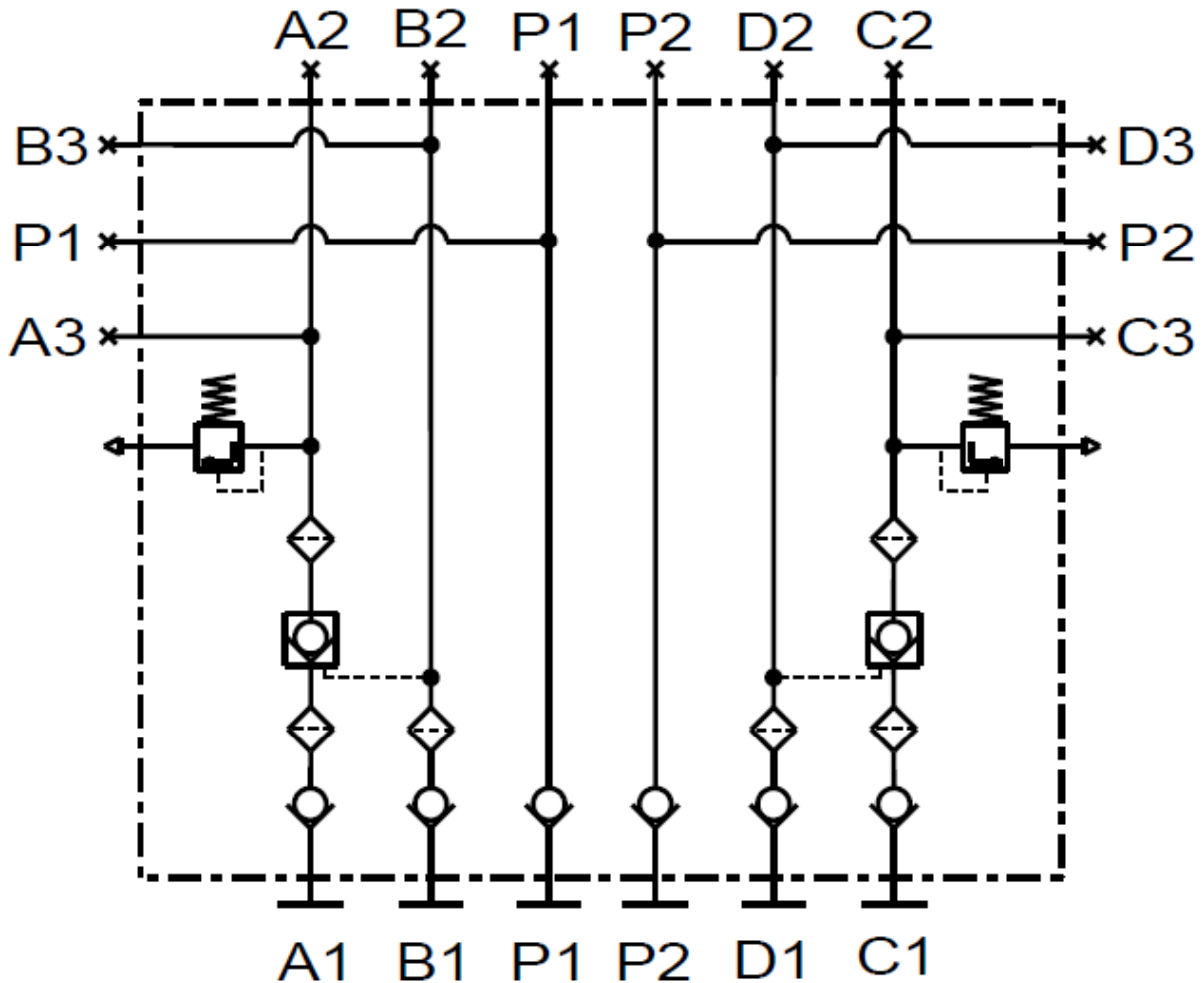


Figure 6: PALLET RECEIVER Hydraulic Schematic

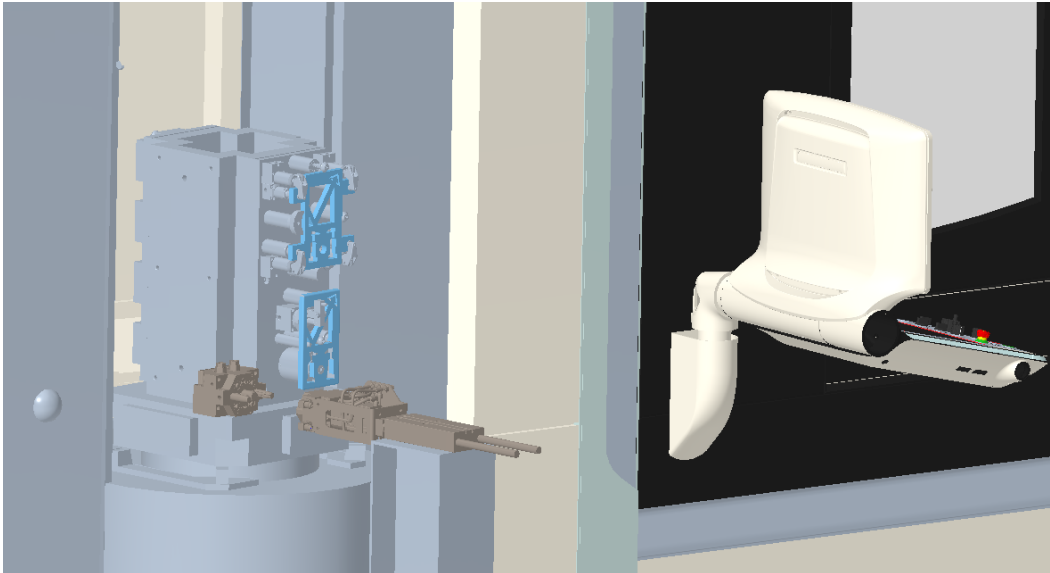
**Note on check valves:**

The PALLET RECEIVER incorporates a crucial design feature using two pilot-operated check valves for each clamp circuit (A and C). These valves maintain clamping pressure even after the pump is disconnected, ensuring a secure and reliable clamping operation. To release pressure in clamp circuit A, it is necessary to pressurize unclamp circuit B. Circuits C and D operate in the same manner.

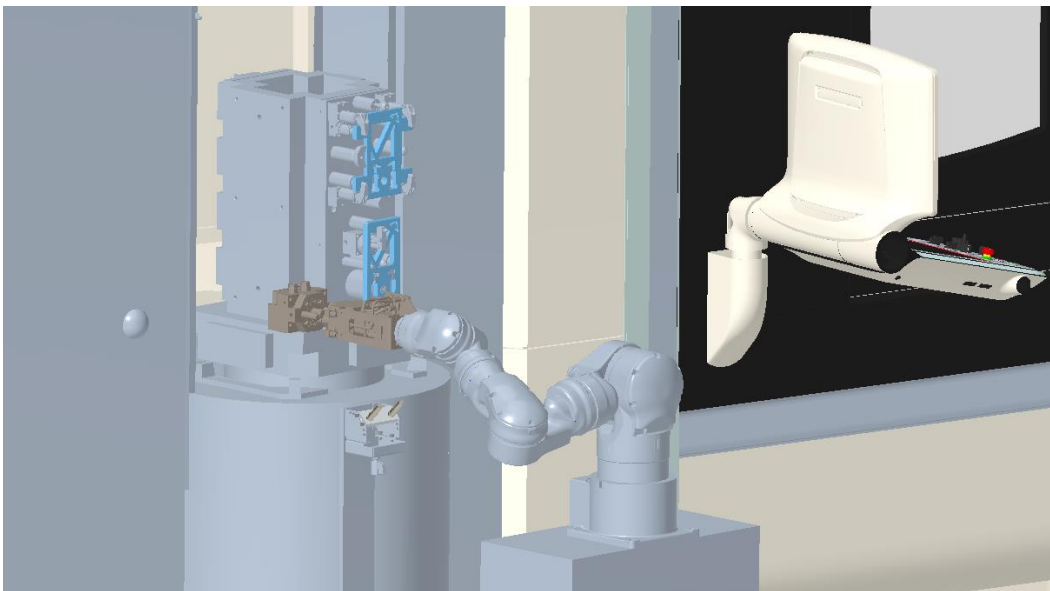
## Installing the AUTO-COUPLER

### ***Mounting Considerations***

The AUTO-COUPLER should typically be mounted outside the machining enclosure. If it is installed inside, it is best practice to keep the AUTO-COUPLER protected from chips and high-pressure coolant spray. For the best performance, the AUTO-COUPLER should be mounted or stored out of the machining environment and slid into place with an air slide or put into place with a robot.



**Figure 7: AUTO-COUPLER with slide**



**Figure 8: AUTO-COUPLER with robot**

**Mounting Pattern:** Mount the AUTO-COUPLER using 4x 1/4" or 4x 5mm bolts. The inner bolt pattern will fit Vektek supplied air slides, the outer bolt pattern is included for increased mounting options and versatility.

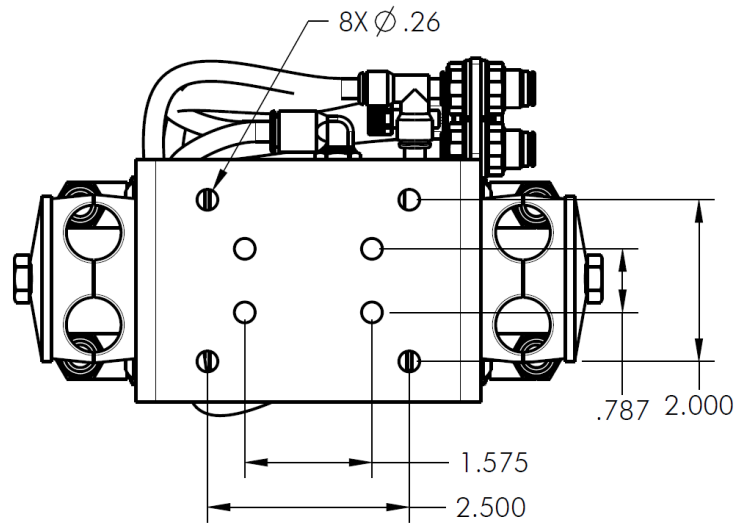


Figure 9: AUTO-COUPLER mounting options.

**Hydraulic connections:** The AUTO-COUPLER comes equipped with 4 JIC-6 Male hydraulic fittings. Hoses should be connected to these fittings and secured to the AUTO-COUPLER using the provided hose mounts, in such a way as to allow for the free movement of the AUTO-COUPLER during the coupling process.

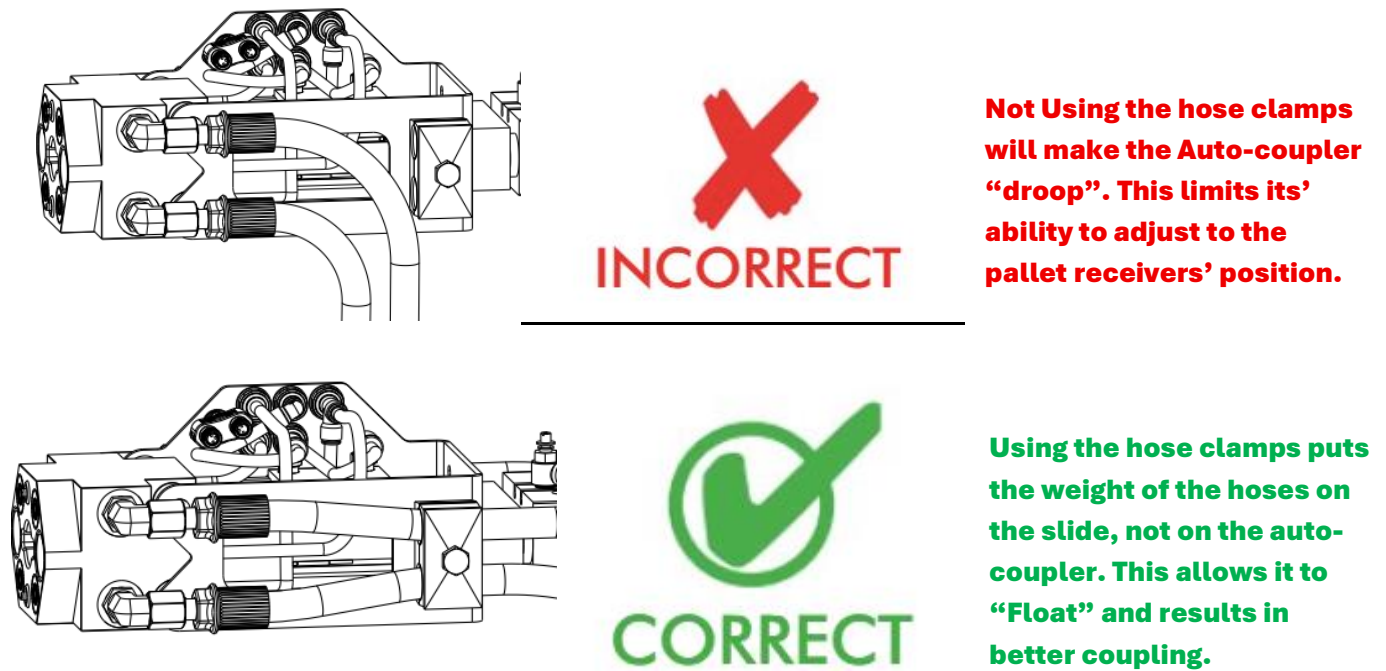


Figure 10: Hose Mounting

**Vektek AutoCoupler Slides:** Vektek offers two standard AutoCoupler Slides: one with a 6" stroke and one with a 16" stroke. Below is a rough parts breakdown of both slides. If adapting an AutoCoupler that was robot mount, to slide mount, be sure to order all associated hardware.

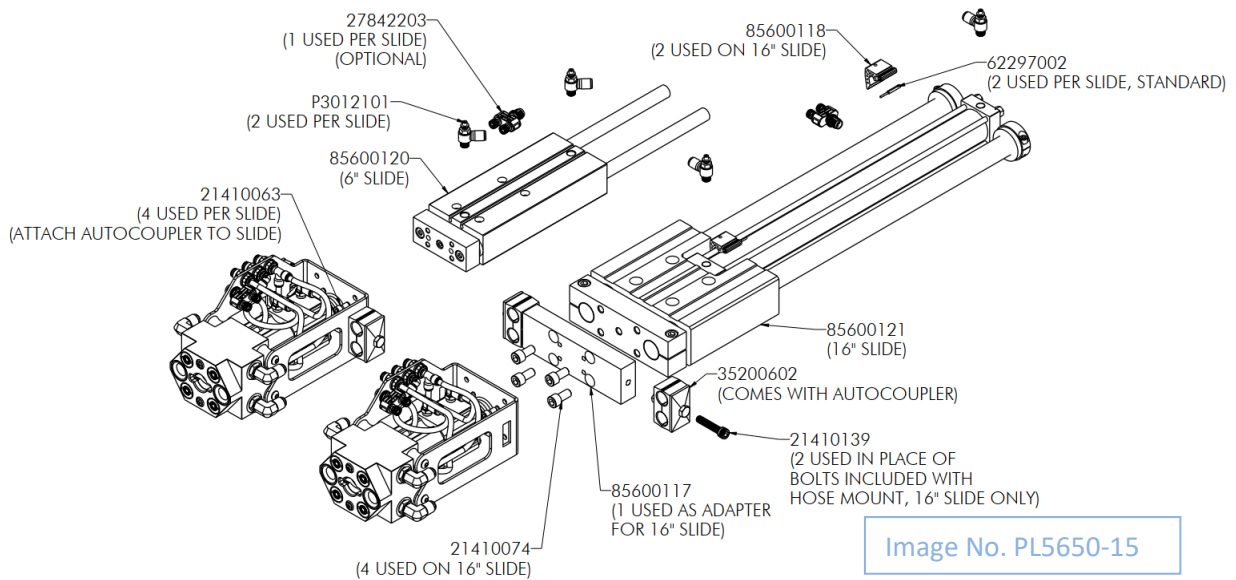


Figure 11: AutoCoupler Slide Breakdown

**Vektek AutoCoupler Slide Mounting Patterns:** Below are the recommended mounting patterns for the AUTO-COUPLER slides.

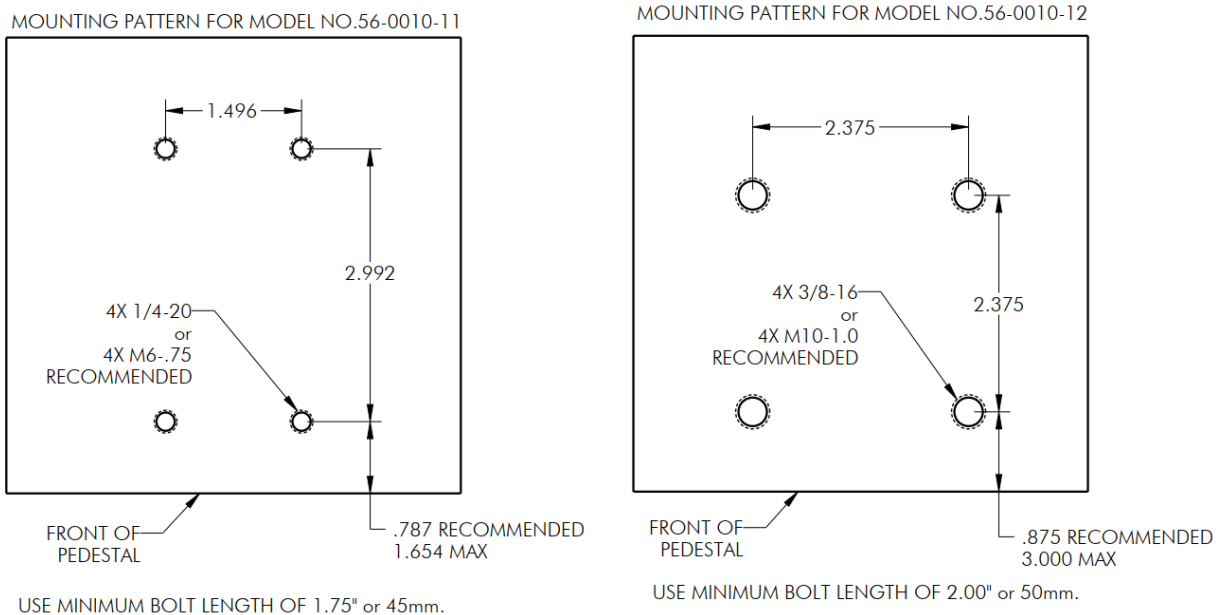
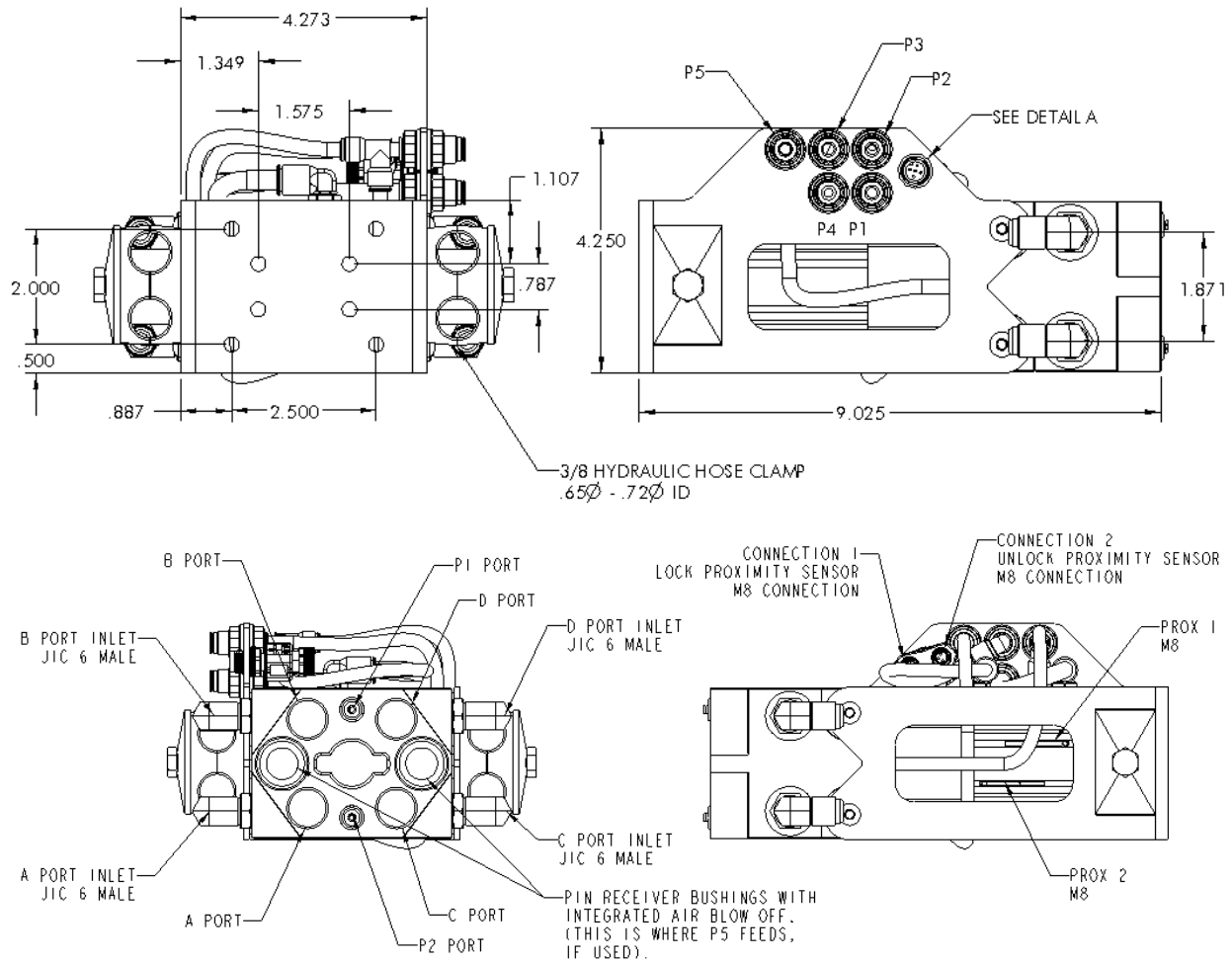


Figure 12: AutoCoupler Slide Mounting

**Pneumatic and sensing connections:** There are 5 pneumatic ports on the AUTO-COUPLER. Ports P3 & P4 are used to couple and uncouple the AUTO-COUPLER once it is in position. Ports P1 & P2 can optionally be used as air pass throughs for air sensing capable clamps. (These couple and decouple just like the hydraulic pass-thru's). Port P5 is used for the air blow off on the PALLET RECEIVER before coupling to clear the hydraulic elements of debris.



PNEUMATIC PORT INFORMATION		
PORT#	TYPE	DESCRIPTION
P1	1/4 PUSH FITTING	AIR PASS THRU 1
P2	1/4 PUSH FITTING	AIR PASS THRU 2
P3	1/4 PUSH FITTING	USED TO RETRACT INTERNAL CYLINDER UNLOCKING AUTOCOUPLER FROM PALLET RECEIVER USED DURING AUTOCOUPLER RETRACTION.
P4	1/4 PUSH FITTING	USED TO EXTEND INTERNAL CYLINDER LOCKING AUTOCOUPLER TO PALLET RECEIVER USED DURING AUTOCOUPLER EXTENSION.
P5	1/4 PUSH FITTING	COUPLING SURFACE BLOW OFF PORT. THIS PORT BLOWS AIR PAST THE ALIGNING PINS CLEARING THE AUTOCOUPLER/PALLET RECIEVER MATING SURFACE DURING THE COUPLING PROCEDURE.

Image No. ILC56001010

Figure 13: Pneumatic and sensing connections

*AUTO-COUPLER States and Signal Logic (with slide)*

**General Overview:**

State 1: AUTO-COUPLER Home

- Slide retracted.
  - Slide Pneumatic Valve Deactivated.
  - Prox sensor #3 active.
- Pneumatic coupler unlocked.
  - Coupler Pneumatic Valve Deactivated.
  - Prox sensor #1 active.

State 2: AUTO-COUPLER Extended – Ready to Couple

- Slide extended. (Slide actuation to be 1-3s, adjust with flow controls)
  - Slide Pneumatic Valve activated.
  - Prox sensor #4 active.
- Pneumatic coupler unlocked.
  - Coupler Pneumatic Valve Deactivated.
  - Prox sensor #1 active.

State 3: AUTO-COUPLER Extended – Coupled

- Slide extended.
  - Slide Pneumatic Valve activated.
  - Prox sensor #5 active. (not provided, optional)
    - When coupled the slide will move forward .21”
    - Prox sensor #5 confirms successful coupling.
- Pneumatic coupler locked.
  - Coupler Pneumatic Valve activated.
  - Prox sensor #2 active.

State 4: Unclamp & Clamp Cycle

- Unclamp – Pressurize B and D circuits.
  - Unload finished part.
  - Load new part.
- Clamp – Pressurize A and C circuits.

State 5: AUTO-COUPLER uncoupled - Ready to be retracted (Same sensor state as State 2)

- Slide extended.
  - Slide Pneumatic Valve activated.
  - Prox sensor #4 active.
- Pneumatic coupler unlocked.
  - Coupler Pneumatic Valve Deactivated.
  - Prox sensor #1 active

State 6: AUTO-COUPLER Home

- Slide retracted.
  - Slide Pneumatic Valve Deactivated.
  - Prox sensor #3 active
- Pneumatic coupler unlocked.
  - Slide Pneumatic Valve Deactivated.
  - Prox sensor #1 active

# Vektex Auto-Coupler User's Guide

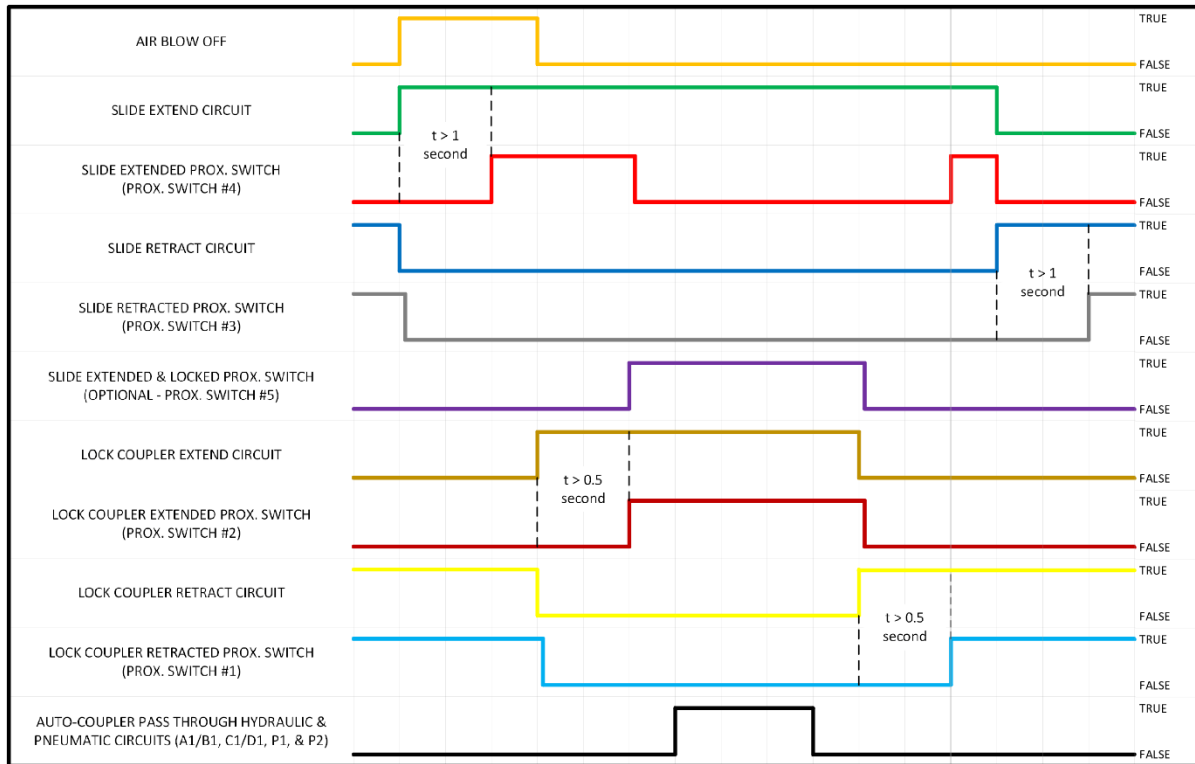


Figure 14: State Diagram

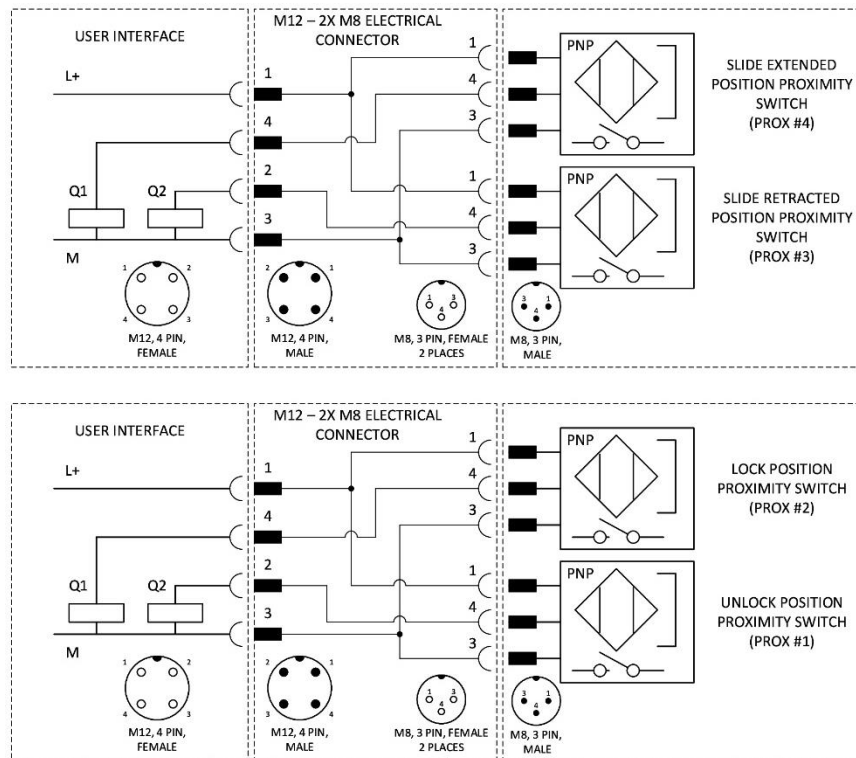


Figure 15: PNP Electrical Schematic

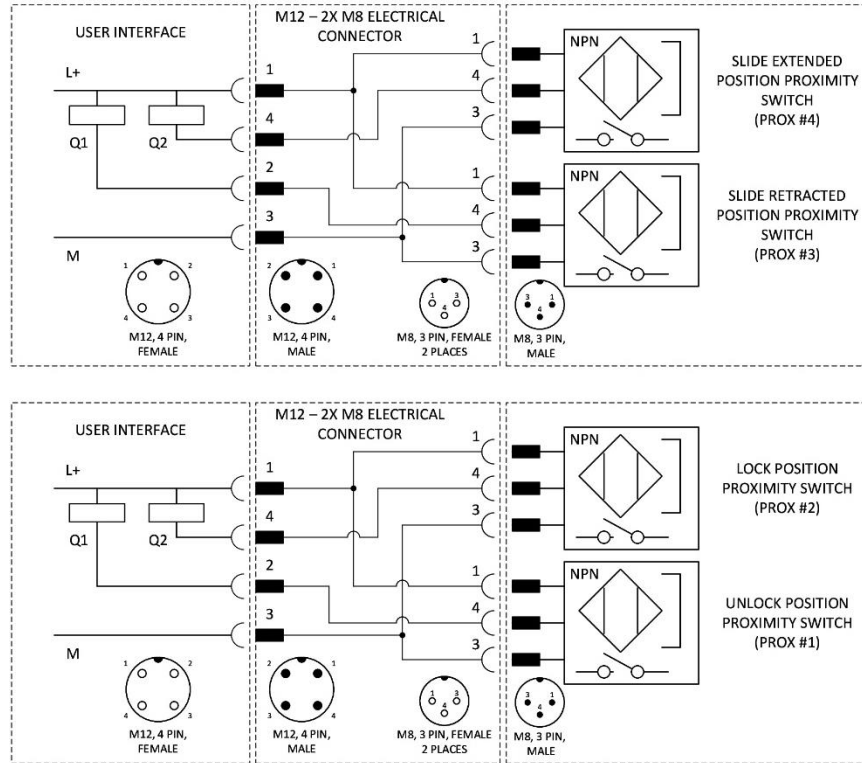


Figure 16: NPN Electrical Schematic

## **AUTO-COUPLER – Robot Integration FAQ**

### **How much does the AUTO-COUPLER weigh?**

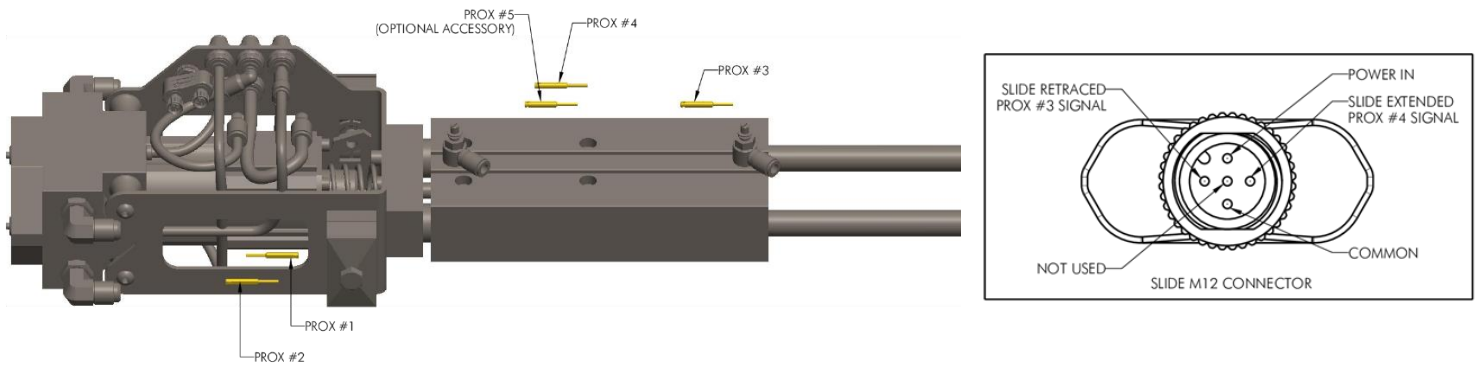
The AUTO-COUPLER weighs 9.6lbs, but it is also important to consider the weight of the hoses that are connected to the AUTO-COUPLER when specifying a robot with enough capacity to use the AUTO-COUPLER.

### **How much force does it take to push the AUTO-COUPLER in position to be ready to lock?**

The force to push the AUTO-COUPLER in place depends on the amount of misalignment there is with the PALLET RECEIVER. At maximum misalignment 70lbf will be needed to push the AUTO-COUPLER onto the PALLET RECEIVER alignment pins. Limit force to push to a maximum of 140Lbf.

### **What is the Locking Stroke of the AUTO-COUPLER?**

The AUTO-COUPLER will need to move forward .21” to lock. This will be powered by the AUTO-COUPLER’s locking mechanism and not forced by the robot, but the robot will need to move forward as it locks.



**Figure 17: Prox Switch Locations (Exploded view)**

### **Sensor Adjustments:**

Upon setting up the AUTO-COUPLER the prox switches may have to be adjusted for proper functionality. Prox switch #3 can be properly adjusted by retracting the slide all the way to its home state. However, prox switch #4 can only be properly adjusted when the PALLET RECEIVER is installed, and the AUTO-COUPLER is fully pushed into place and ready to lock. Prox switch #5 can be adjusted once the AUTO-COUPLER is fully locked to the PALLET RECEIVER in the application. Prox Switches #1 and #2 will be pre-set from the factory and should not need adjustment. But to correctly set these simply unlock and adjust prox switch #1 and lock and adjust prox switch #2.

### **Specifications**

#### Air Pressure:

- Max air pressure: 150 PSI
- Min air pressure: 90 PSI

#### Hydraulic Pressure:

- Max hydraulic pressure: 5,000 PSI
- Min hydraulic pressure: 500 PSI

#### Prox Switch Electrical Specifications:

- 2-5 PNP Position Sensors
  - 10-30 VDC
  - 100 mA max
  - SWITCH BURDEN:  $\leq 8$  mA

#### Slide Force Requirements (For user supplied slides)

- Maximum Force: 140Lbf
- Minimum Force: 70Lbf

## Maintenance

### PALLET RECEIVER

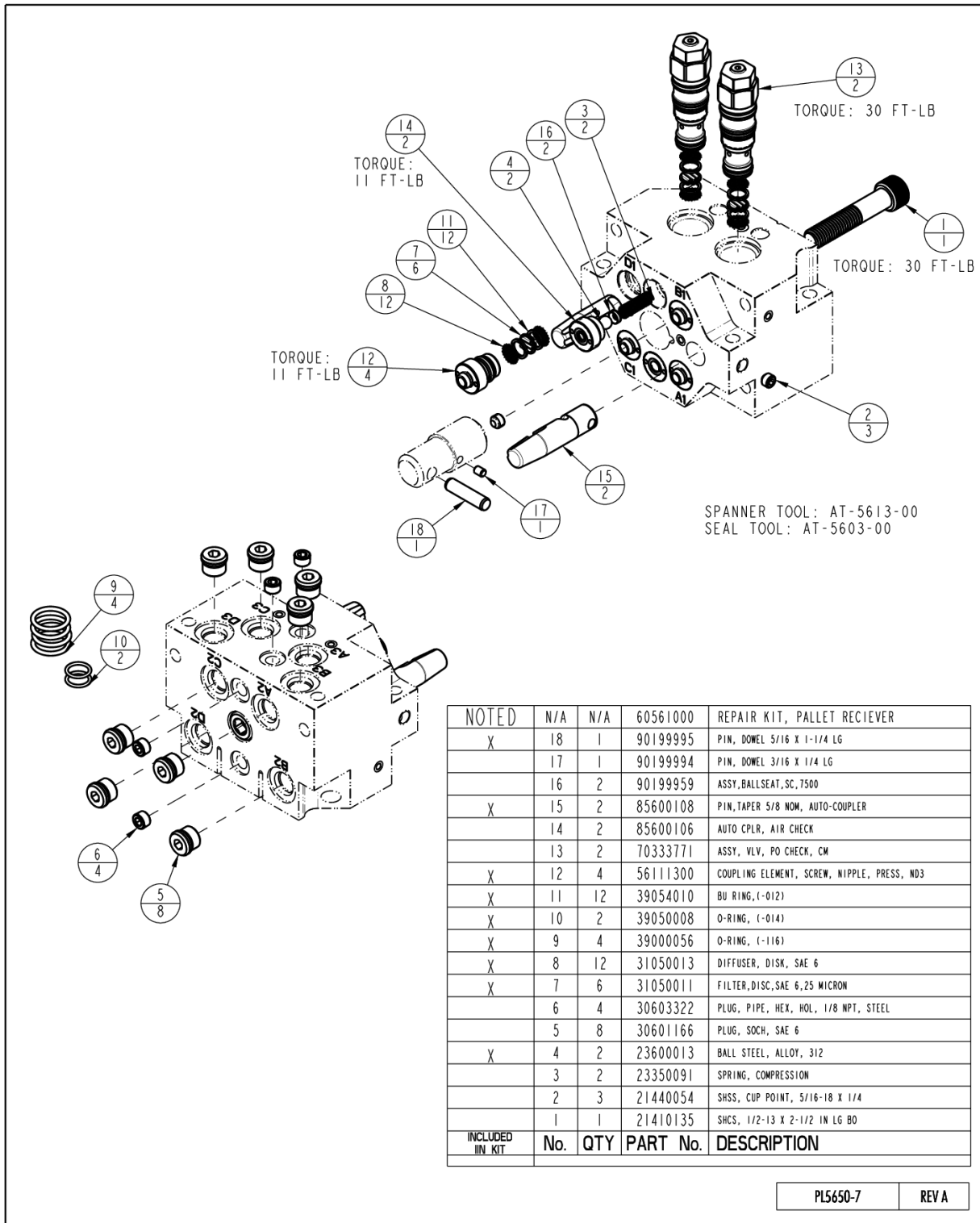
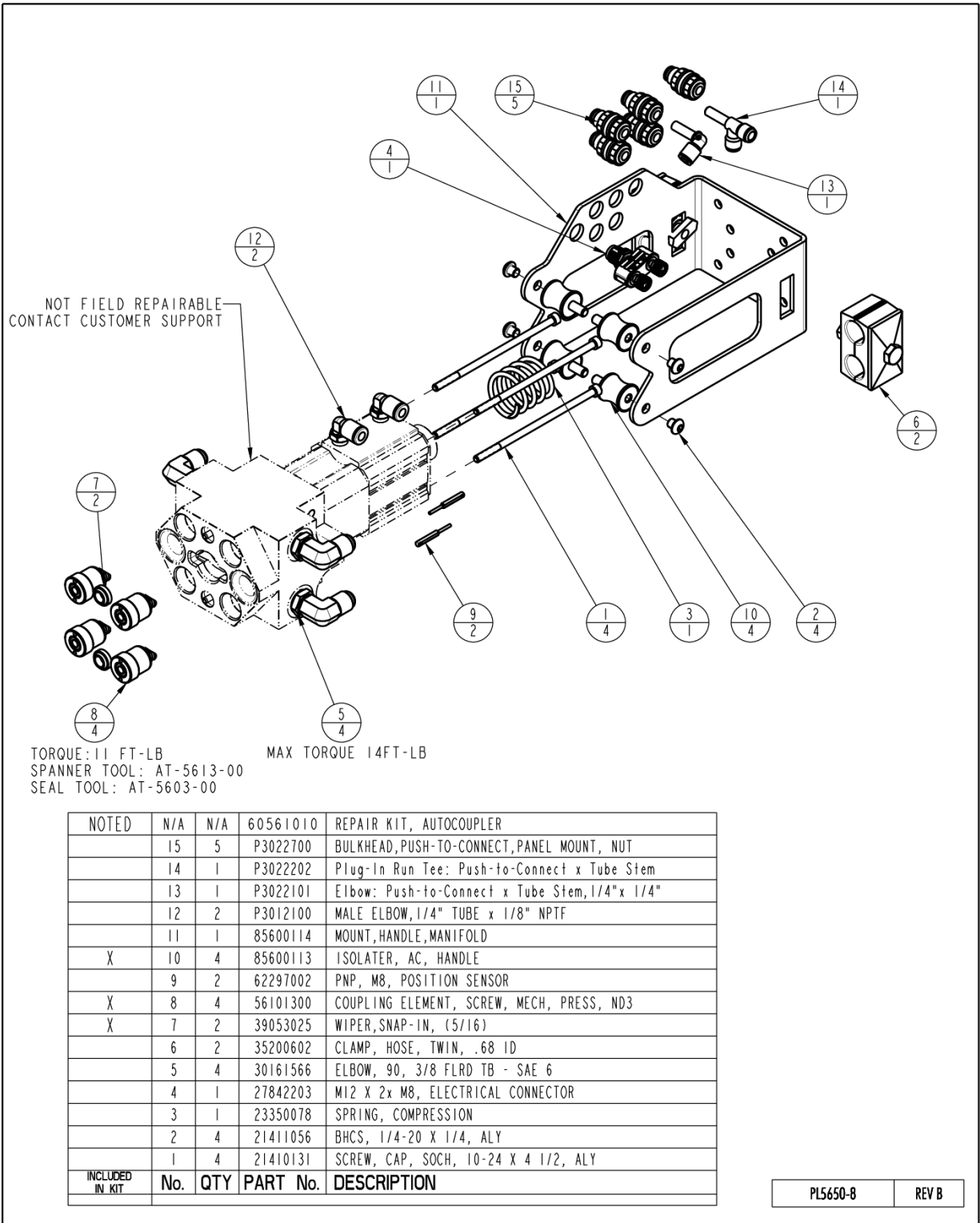


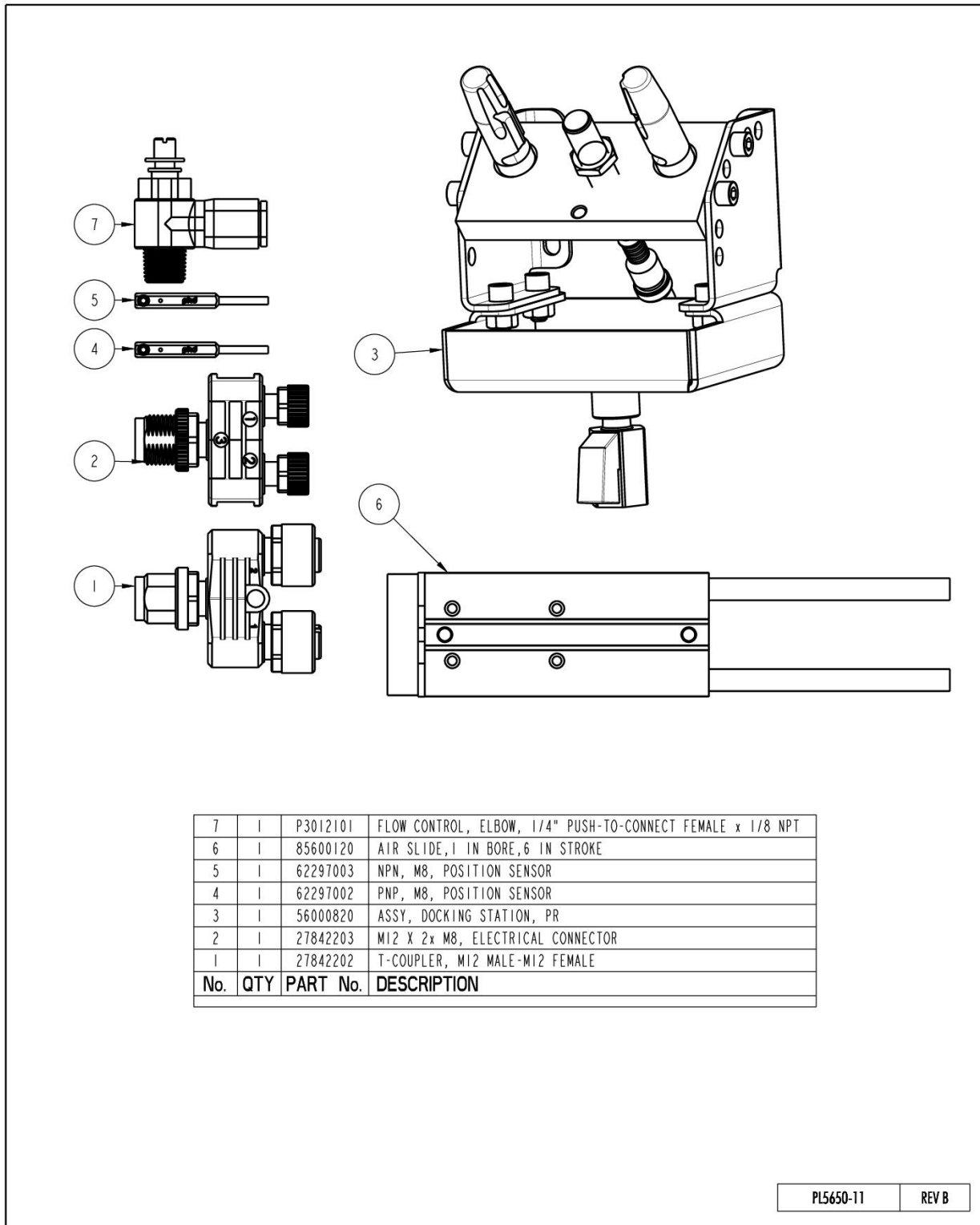
Figure 18: PALLET RECEIVER Breakdown

**AUTO-COUPLER**

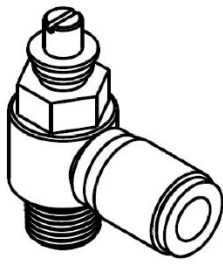


**Figure 19: AUTO-COUPLER Breakdown**

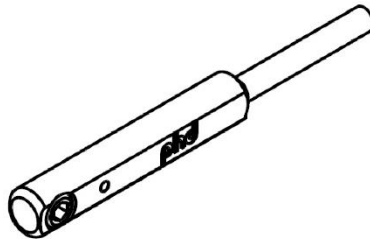
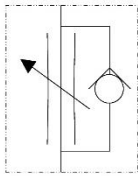
**Accessory Items**



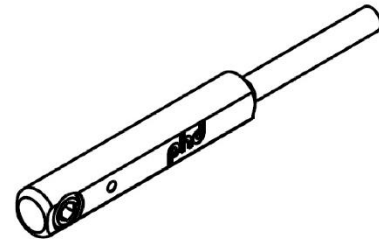
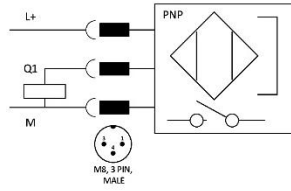
**Figure 20: Accessories**



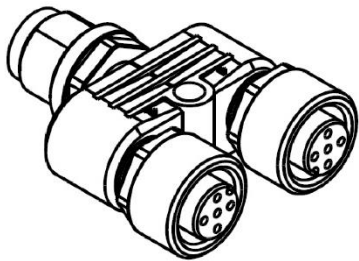
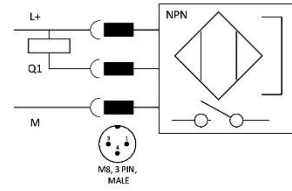
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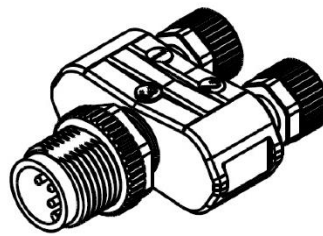
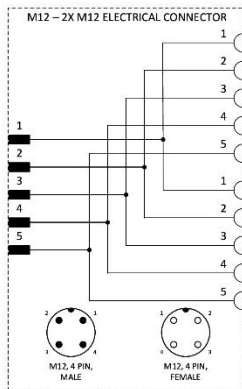
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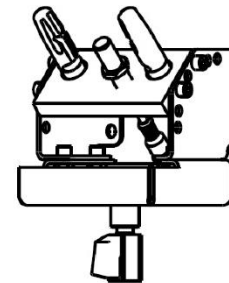
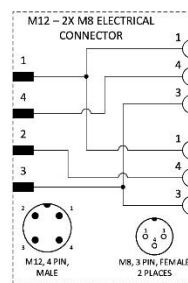
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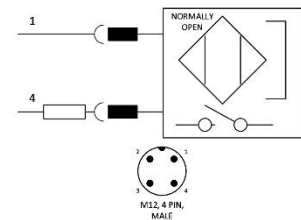


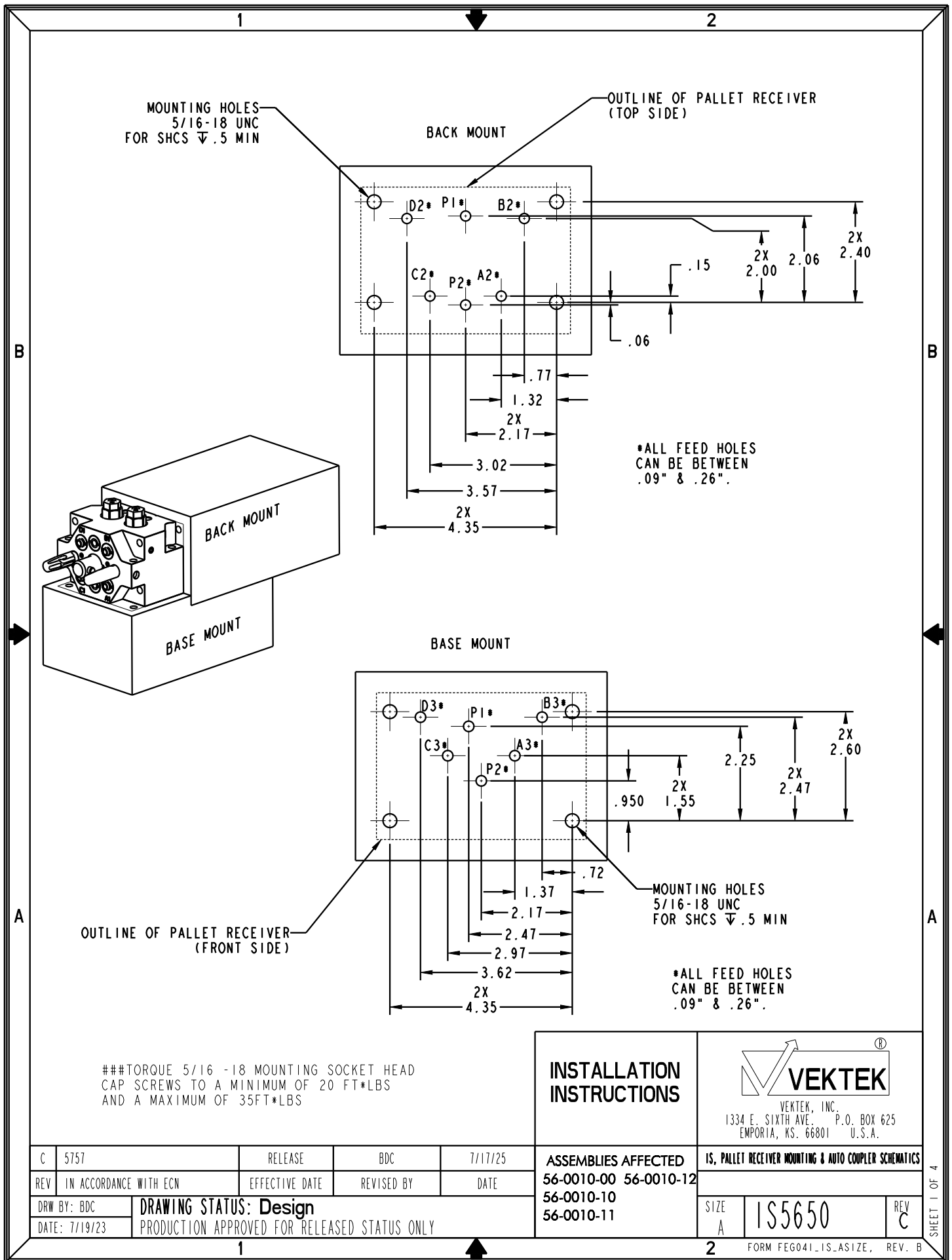
Figure 21: Accessories' Wiring Diagrams

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Troubleshooting

Symptom	Cause	Solution
AUTO-COUPLER will not couple	<ol style="list-style-type: none"><li>1. Hydraulic elements are worn out.</li><li>2. Rubber isolators worn out.</li></ol>	<ol style="list-style-type: none"><li>1. Replace worn out hydraulic elements.</li><li>2. Replace rubber isolators.</li></ol>
PALLET RECEIVER not holding pressure	<ol style="list-style-type: none"><li>1. Check valves need to be serviced</li></ol>	<ol style="list-style-type: none"><li>1. Replace cartridge PO Check valves.</li></ol>

**If the preceding chart does not correct the problem, please contact Vektek Customer Support Engineers at 1-800-992-0236 for additional assistance. Please have AUTO-COUPLER revision available for technical support.**



###TORQUE 5/16 -18 MOUNTING SOCKET HEAD CAP SCREWS TO A MINIMUM OF 20 FT\*LBS AND A MAXIMUM OF 35FT\*LBS

<b>INSTALLATION INSTRUCTIONS</b>		 VEKTEK, INC. 1334 E. SIXTH AVE. P.O. BOX 625 EMPORIA, KS. 66801 U.S.A.	
<b>ASSEMBLIES AFFECTED</b> 56-0010-00 56-0010-12 56-0010-10 56-0010-11		<b>IS, PALLET RECEIVER MOUNTING &amp; AUTO COUPLER SCHEMATICS</b>	
SIZE A	<b>IS5650</b>	REV C	SHEET 1 OF 4

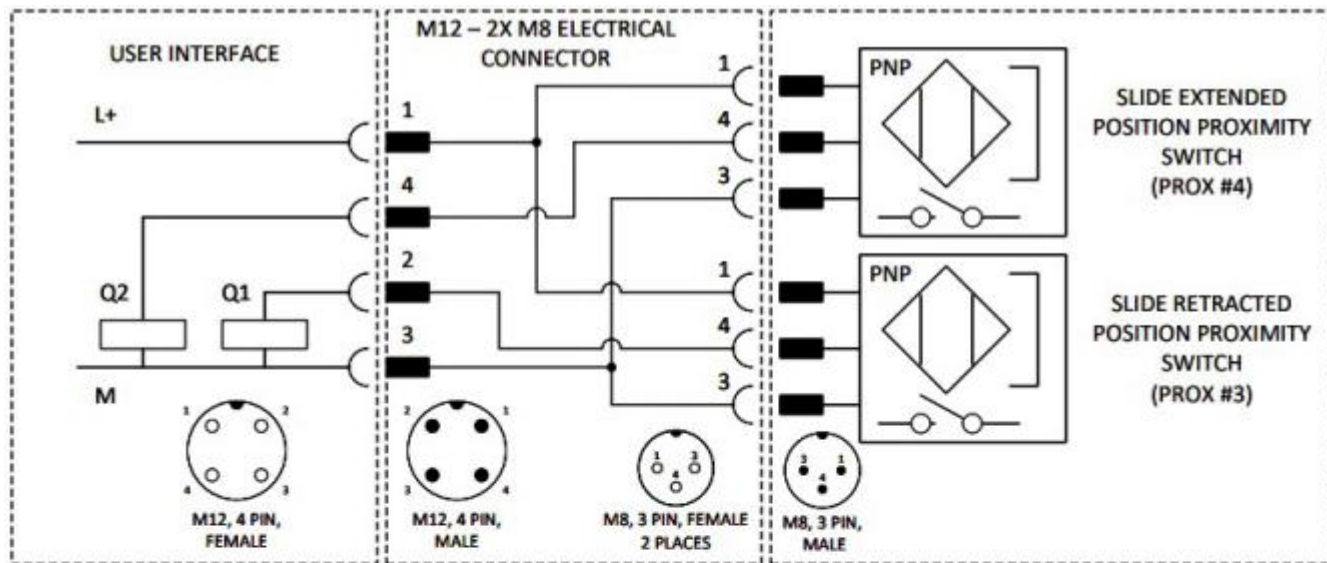
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REV	IN ACCORDANCE WITH ECN	EFFECTIVE DATE	REVISED BY	DATE
DRW BY:	DRAWING STATUS: Design			
DATE: 7/19/23	PRODUCTION APPROVED FOR RELEASED STATUS ONLY			

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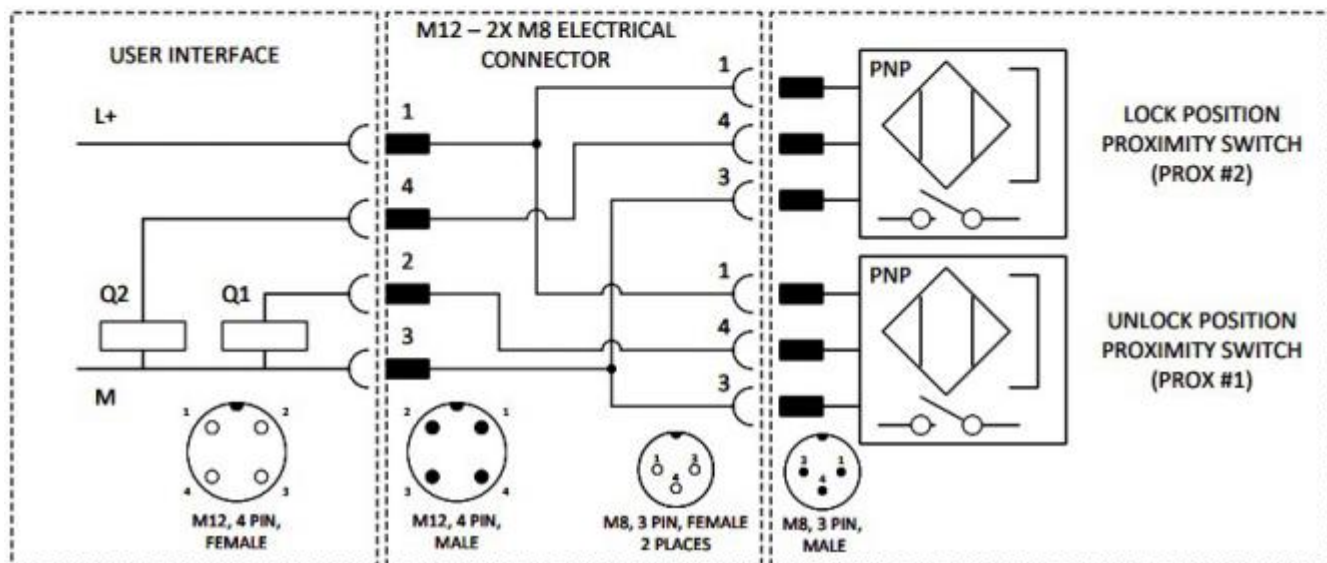
B

B



A

A



### INSTALLATION INSTRUCTIONS



VEKTEK, INC.  
 1334 E. SIXTH AVE. P.O. BOX 625  
 EMPORIA, KS. 66801 U.S.A.

C	5757	RELEASE	BDC	7/17/25
REV	IN ACCORDANCE WITH ECN	EFFECTIVE DATE	REVISED BY	DATE
DRW BY:	BDC	<b>DRAWING STATUS: Released</b>		
DATE:	7/19/23	PRODUCTION APPROVED FOR RELEASED STATUS ONLY		

**ASSEMBLIES AFFECTED**  
 56-0010-00 56-0010-12  
 56-0010-10  
 56-0010-11

IS, PALLET RECEIVER MOUNTING & AUTO COUPLER SCHEMATICS

SIZE A  
 IS5650

REV C

SHEET 2 OF 4

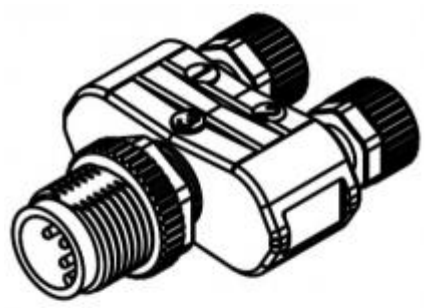
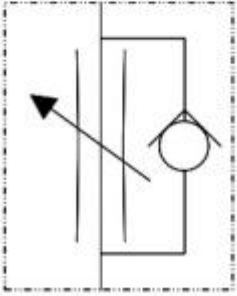
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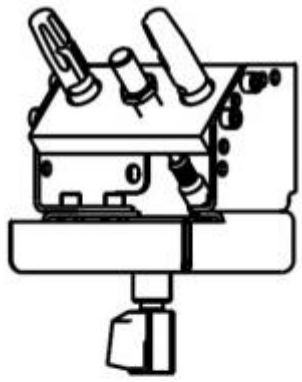
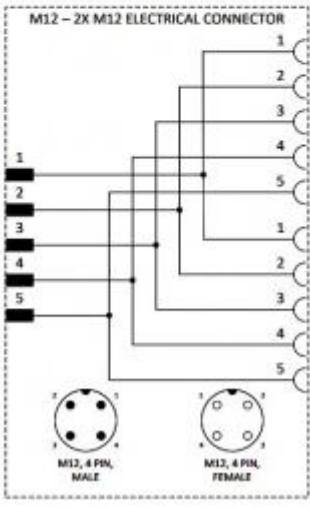
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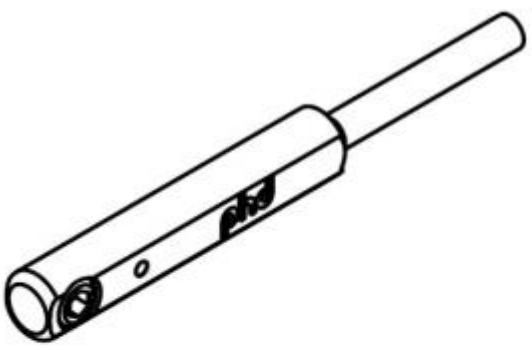
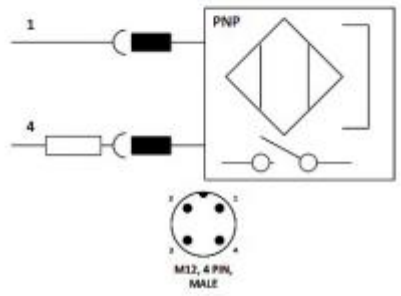
P3-0121-01



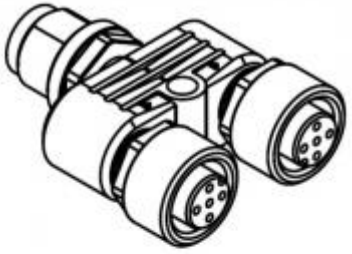
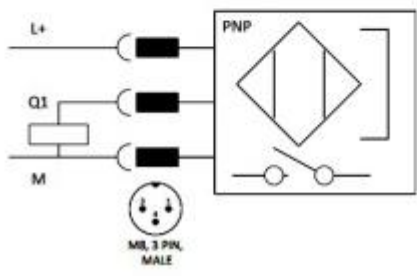
27-8422-03



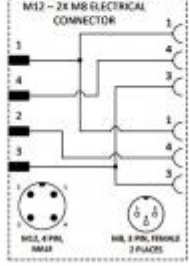
56-0008-20



62-2970-02



27-8422-02



**INSTALLATION INSTRUCTIONS**



VEKTEK, INC.  
1334 E. SIXTH AVE. P.O. BOX 625  
EMPORIA, KS. 66801 U.S.A.

C	5757	RELEASE	BDC	7/17/25
REV	IN ACCORDANCE WITH ECN	EFFECTIVE DATE	REVISED BY	DATE
DRW BY:	BDC	<b>DRAWING STATUS: Released</b>		
DATE:	7/19/23	PRODUCTION APPROVED FOR RELEASED STATUS ONLY		

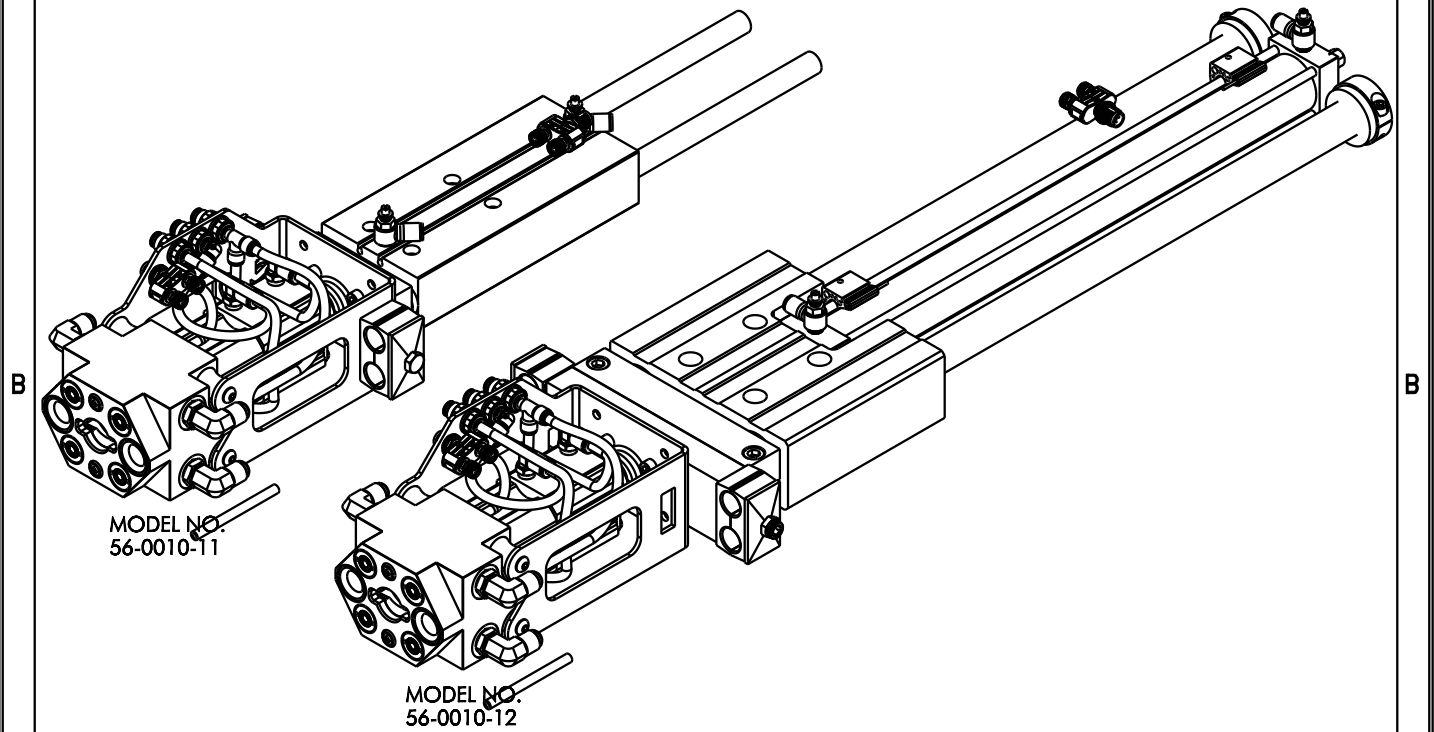
**ASSEMBLIES AFFECTED**  
56-0010-00 56-0010-12  
56-0010-10  
56-0010-11

**IS, PALLET RECEIVER MOUNTING & AUTO COUPLER SCHEMATICS**  
SIZE A  
**IS5650**

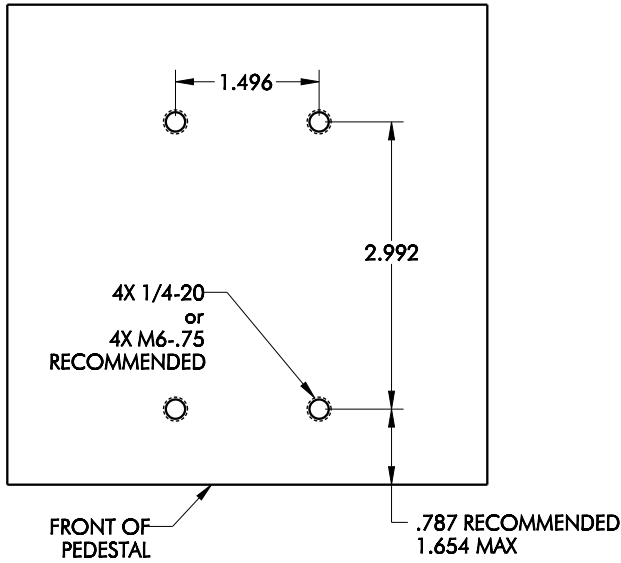
FORM FEG041-IS.AS1Z, REV. B

SHEET 3 OF 4

# MOUNT A' SLIDE

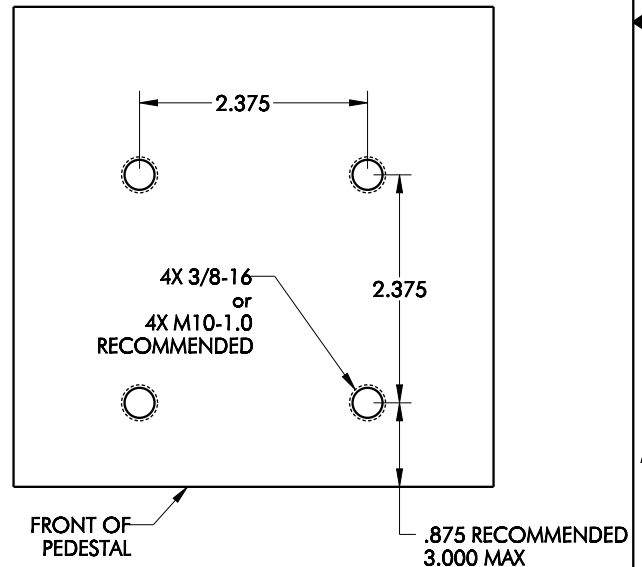


MOUNTING PATTERN FOR MODEL NO.56-0010-11



USE MINIMUM BOLT LENGTH OF 1.75" or 45mm.

MOUNTING PATTERN FOR MODEL NO.56-0010-12



USE MINIMUM BOLT LENGTH OF 2.00" or 50mm.

## INSTALLATION INSTRUCTIONS



VEKTEK, INC.  
1334 E. SIXTH AVE. P.O. BOX 625  
EMPORIA, KS. 66801 U.S.A.

ASSEMBLIES AFFECTED  
56-0010-00 56-0010-12  
56-0010-10  
56-0010-11

IS, PALLET RECEIVER MOUNTING &  
AUTO COUPLER SCHEMATICS

SIZE  
A 1S5650

REV  
C

C	5757	RELEASE	BDC	7/17/25
REV	IN ACCORDANCE WITH ECN	EFFECTIVE DATE	REVISED BY	DATE
DRW BY:	BDC	DRAWING STATUS: Released		
DATE:	7/19/23	PRODUCTION APPROVED FOR RELEASED STATUS ONLY		

SHEET 4 OF 4